ROUTING AND RECORD SHEET

SUBJECT: (Optional)

EXECUTIVE SUMMARY AND STUDY OF PAY MODELS

FROM: [redacted]
C/HRPS/OP
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EXTENSION [redacted]

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DATE 2 March 1983 STAT

TO: (Officer designation, room number, and building)	DATE RECEIVED	DATE FORWARDED	OFFICER'S INITIALS	COMMENTS (Number each comment to show from whom to whom. Draw a line across column after each comment.)
1. DD/OP-PA&E 1006 Ames				Don put together quite a useful study, particularly if the pay schedule is raised again. We can use the existing data base and model to try other cuts and changes. Don is also prepared to provide an overview briefing - if desired. [redacted] STAT
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11.				Distribution: Original - Pay Study File 1 - D/OP 1 - Chrono (Summary & Pay Study) OP/HRPS [redacted] cm (STAT3)
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FORM 1-79 **610** USE PREVIOUS EDITIONS

EXECUTIVE SUMMARY

1. A recent OP study recommended the creation of a unique Intelligence Officer (IO) Salary Schedule. To test the impact of the proposed schedule, HRPS agreed to build a simulation model of the schedule, convert a sample of Agency personnel to it at a previous point in time, and to see how they progressed under the new schedule as the model brought them up to date. In this manner, their progress under the present schedule could be compared to the progress they would have experienced under the new schedule. The most dramatic effects of the model over the six-year progression period were (1) the placement of 50% of all employees in the top step of their grade for at least two years, and (2) a general increase in absolute salary for most employees.

2. In an effort to simplify the conversion factors, all model conversions and manipulations were done in current General Schedule dollar equivalents. In addition, rather than worry with the statistical validity of a sample, all [ ] of the eligible Agency employees were placed in the model. STAT

3. In general, the way the model was designed to work is a follows. All employees who were between grades GS-07 and GS-15 in both 1976 and 1982 were converted to an equivalent 1976 IO Schedule grade and step. They were then brought up to 1982 in the IO Schedule with actual date promotions and QSIs, granted according to IO Schedule guidelines. Step increases duplicated historical dates in Model I, and were granted in the IO Schedule two-year increments in Model II. In cycling the model in this manner, the model placed over 50% of our employees at the top of their grade, although only 5% lost actual salary dollars.

4. Only minor modifications of the IO Schedule were attempted in the development of the attached study. However, it should be noted that the model was designed to accommodate numerous factor changes. In the future, it would be very easy to use the existing model and data base to "play" with the proposed pay schedule by modifying factors to observe the impact of the changes.

HRPS/OP
25 Feb 83

STUDY OF PAY MODELS

I. PURPOSE AND METHOD OF COMPARISON

(A) The major purpose of this study is to contrast the effects of the Intelligence Officers (IO) pay system with the effects of the General Schedule (GS) pay system over a specific period of time. Since the IO pay system is only concerned with the salaries of employees in the professional job category, the only GS grades of concern in this study are the GS-07 through GS-15.

(B) One of the most thorough methods to study the effects of the two pay systems is to select two independent groups of employees and pay one group under the IO pay system and the other under the GS pay system. The results of the two pay systems can be evaluated by contrasting the two groups. The major disadvantage of the two-group method is the length of time required to obtain the results. An acceptable alternative is to select a group of employees who have been paid under the GS pay system for a 5 to 7 year time period. Since the grade promotions and step increases over the time period for each employee are known, the grade and step values under the IO pay system can be computer simulated. One of the major factors to be considered in the computer simulation of the IO pay system

is how each person in the GS pay system is converted to the IO pay system. The main condition of conversion is to convert each person to the IO grade and step which is equal to or greater than the GS salary the person had at the beginning of the time period. Once the initial grade and step of the IO system are established, the grade promotions and in-grade increases during each successive year can be computed based on the previous year's grade and step under the IO pay system.

(C) The first hypothesis to test is how the grade and step distributions of the two pay systems differ at the end of each successive year. Most notably it is of interest to determine in each pay system the number of employees at the maximum step of each grade during each successive year.

(D) The second hypothesis to test is the amount of dollar difference between the salaries of the IO pay system and GS pay system. One procedure of achieving a salary comparison is to have the salaries of each grade and step for both pay systems reflected in constant 1982 dollars. The salary of the IO pay system can then be directly contrasted against the salary of the GS pay system. If the GS salary is subtracted from the IO salary for each person in the population at the end of each successive year, then it is very easy to graphically represent the dollar difference between the two pay systems.

II. SELECTION AND DESCRIPTION OF POPULATION

(A) The population or group of employees who are selected for this study are based on the employees whose careers would be affected by the proposed IO pay system. Since the IO pay system is concerned with only those employees of a professional category between the GS grades 7 through 15, the population under study are those people who have career paths between the grades GS-07 and GS-15.

(B) A second requirement in the selection of the study's population is that the data about each person must be readily available, and the only data which meet this requirement are the historical PERSIGN records from 1976 to the end of fiscal year 1982. Thus, our population consists of all professional employees whose GS grade range is from GS-07 through GS-15 between the years 1976 and 1982.

(C) The descriptive statistics of the study's population are as follows:

III. DESCRIPTION OF COMPUTER SIMULATION MODELS

(A) MODEL I

The first computer model investigated is a parallel model in which the GS grade promotions and step increases are paralleled by the computer simulation of the IO pay system. The first step in the computer model is to determine for each employee in the population the IO grade and step based on the employee's GS grade and step in 1976. Rules for converting each employee's GS grade to the appropriate IO grade are specified in the Agency's Compensation Study (prepared by [redacted] and [redacted] 1982). These rules are specified in the computer program and in each instance the conversion to the IO pay system from the GS pay system is to the lowest possible IO grade and step. Further, the IO grade conversion is accomplished such that the computed IO salary of each employee is equivalent to the employee's GS salary. In order to determine the salary equivalence, the IO and GS salaries are computed in terms of 1982 dollars. The following tables and charts show the grade relationship between the IO and GS pay systems and the salaries reflected in 1982 dollars for each grade and step combination.

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TABLE: GS to IO Grade Conversion

GS GRADE	IO GRADE
07	07
08	08
09	09
10	10
11	11 or 12
12	13
13	14 or 15
14	16 or 17
15	18

PROPOSED PROFESSIONAL AND ADMINISTRATIVE (INTELLIGENCE OFFICER) SCHEDULE

(10% INTERGRADE DIFFERENTIAL/34% RANGE SPREAD/6 STEPS WITH 6% INCREMENTS)

GRADE	S-T-E-P-S					
	1	2	3	4	5	6
IO-07	16,737	17,741	18,806	19.934	21,130	22,398
IO-08	18,413	19,518	20,689	21,930	23,246	24,641
IO-09	20,256	21,471	22,760	24,125	25,573	27,107
IO-10	22,282	23,619	25,036	26,538	28,131	29,818
IO-11	24,510	25,981	27,539	29,192	30,944	32,800
IO-12	26,961	28,579	30,293	32,111	34,038	36,080
IO-13	29,657	31,436	33,323	35,322	37,441	39,688
IO-14	32,622	34,579	36,654	38,853	41,185	43,656
IO-15	35,885	38,038	40,320	42,740	45,304	48,022
IO-16	39,473	41,841	44,352	47,013	49,834	52,824
IO-17	43,421	46,026	48,788	51,715	54,818	58,107
IO-18	47,763	50,629	53,667	56,886	60,300	63,918

GENERAL SCHEDULE

18 December 1982

Annual Rates and Steps

GS	1	2	3	4	5	6	7	8	9	10
1	$ 8,676	$ 8,965	$ 9,254	$ 9,542	$ 9,831	$10,000	$10,286	$10,572	$10,585	$10,857
2	9,756	9,987	10,310	10,585	10,703	11,018	11,333	11,648	11,963	12,278
3	10,645	11,000	11,355	11,710	12,065	12,420	12,775	13,130	13,485	13,840
4	11,949	12,347	12,745	13,143	13,541	13,939	14,337	14,735	15,133	15,531
5	13,369	13,815	14,261	14,707	15,153	15,599	16,045	16,491	16,937	17,383
6	14,901	15,398	15,895	16,392	16,889	17,386	17,883	18,380	18,877	19,374
7	16,559	17,111	17,663	18,215	18,767	19,319	19,871	20,423	20,975	21,527
8	18,339	18,950	19,561	20,172	20,783	21,394	22,005	22,616	23,227	23,838
9	20,256	20,931	21,606	22,281	22,956	23,631	24,306	24,981	25,656	26,331
10	22,307	23,051	23,795	24,539	25,283	26,027	26,771	27,515	28,259	29,003
11	24,508	25,325	26,142	26,959	27,776	28,593	29,410	30,227	31,044	31,861
12	29,374	30,353	31,332	32,311	33,290	34,269	35,248	36,227	37,206	38,185
13	34,930	36,094	37,258	38,422	39,586	40,750	41,914	43,078	44,242	45,406
14	41,277	42,653	44,029	45,405	46,781	48,157	49,533	50,909	52,285	53,661
15	48,553	50,171	51,789	53,407	55,025	56,643	58,261	59,879	61,497	63,115

Basic pay is limited by Sec. 5308 of Title 5 of the United States Code to the rate for level V of the Executive Schedule which is, as of the effective date of this schedule, $63,800.

The next step in the computer model is to sequentially progress through each yearly time period and increase or decrease the initial 1976 IO and GS grades, steps and salaries based on the grade promotions and step increases of each employee in the population. Thus, for each employee the grade, step, and salary for the GS and IO pay systems are computed for each successive year (1976-1982). Further, in the promotion instances which result in grades or steps beyond the IO pay structure the employee's computer record is placed in a separate category which will be called the pay structure ceiling. For each time period, the number of employees placed in the ceiling category is a measure of how well the IO pay system accommodates the promotions and step increases of the employee population.

(B) MODEL II

The second model performed on the data is exactly the same as the parallel model except that the step increases for the IO pay system are simulated as non-parallel to the GS pay system. Explicitly, a two-year time in grade is the determination for step increases. Hence, during each successive year the step increase is computed if the employee's time in grade is equal to two years. All other grade and step computations and salary values are determined in the same manner as Model I.

IV. RESULTS OF COMPUTER MODELS

(A) Grade Distributions

(1) The first result of interest is the comparison for each year (1976-1982) of the GS grade-step distribution relative to the computer simulated IO grade-step distribution. Frequency distributions are shown in the appendix entitled "Grade and Step Distributions." The first series of graphs are the GS grade distributions for each time period. The second series of graphs are the IO grade distributions for the parallel model (Model I). Comparing the two sets of graphs, it is obvious by inspection that the IO pay system has a larger proportion of employees in the higher steps of each grade. Moreover, the number of employees in the higher steps increases as time increases from 1976 to 1982. The final set of grade-step distributions in the appendix shows the grade distribution of the IO pay system based on Model II in which the rate of in-grade promotions is decreased. The second model's graphs clearly show the increasing degree

of skewness at the higher steps. Thus, regardless of the simulation model for the IO pay system, the skewness in the grade distributions at the higher steps is present and is the result of the grade and step structure of the IO pay system.

(2) The second important measure of the grade-step distribution is the number of employees in the pay structure ceiling category. Recall that the ceiling category denotes the number of employees entitled to promotions or in-grade increases but are at the top of the IO pay structure. The table below shows that for both computer models the number of employees in the ceiling category increases as time increases from 1976 to 1982. In fact, fifty percent of the population is in the ceiling category at the end of 1982.

Time Period	Number in Ceiling Category	
	Model I	Model II
1976		
1977		
1978		
1979		
1980		
1981		
1982		
TOTAL		

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(3) From the grade-step distribution comparisons and the pay structure ceiling category results, the overall grade and step structure of the IO pay system does not have the flexibility to accommodate the grade and step increases which occurred in the GS pay system. Moreover, decreasing the rate of in-grade promotions, as in Model II, does not correct the lack of pay structure flexibility.

B) SALARY COMPARISONS

(1) The basic results of a preliminary comparison of the salaries computed for the GS and IO pay systems show a general increase in salary for most employees in the IO pay system. The reason for this finding is that the IO pay scale is its geometrically increasing salary progression. In other words, each step or grade increase results in an increase in salary based on a percentage increase of the employee's previous salary. The GS pay scale, on the other hand, increases at a fixed rate between steps within the same grade. Thus, the GS pay scale increases linearly and the IO pay scale increases geometrically. The result is a larger salary gain under the IO pay scale.

(2) The second method of comparing the effect of the IO pay systems is to count the number of employees who have computed IO salaries which are less than the corresponding GS salaries at each time period. The table below shows the number of employees in the population who have IO salaries which are less than the corresponding GS salaries. The general finding is that approximately five percent of the population is adversely affected by the IO pay scale.

Time Period	Number of Employees	% Pop
1976		
1977		
1978		
1979		
1980		
1981		
1982		

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(C) CONCLUSIONS

The model demonstrates that the IO pay system is not as flexible as the GS pay system. The conclusion to be drawn from this is that the IO salary scale would cost the Agency more than the GS scale for employee salaries, but more than 50% of the employees could derive any further pay raises only through promotions.

APPENDIX

1. Set 1 of Grade Distribution Graphs (GS Pay System)
2. Set 2 of Grade Distribution Graphs (IO Pay System Model I)
3. Set 3 of Grade Distribution Graphs (IO Pay System Model II)
4. SAS Computer Program of Computer Simulation Models

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February 1983